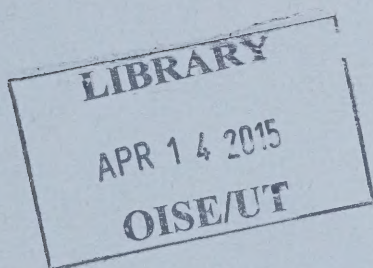


ONTARIO ASSESSMENT INSTRUMENT POOL



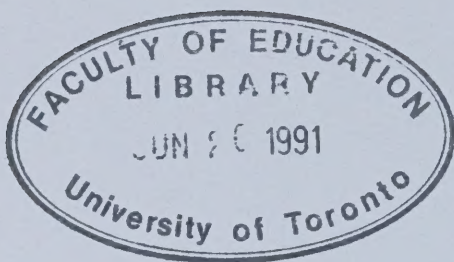
DRAFT

OAC BIOLOGY

OPTIONAL UNIT I

ANIMAL BEHAVIOUR

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ONTARIO ASSESSMENT INSTRUMENT POOL

DRAFT

OAC BIOLOGY

OPTIONAL UNIT I

ANIMAL BEHAVIOUR

Response/Marking Scheme

Correct response: A

Teacher Notes

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Queen's Park
Toronto, Ontario

ISBN 0-7729-6270-7
CD 08710

Canadian Cataloguing in Publication Data

Main entry under title:

OAC Biology

On cover: Ontario assessment instrument pool.
"Draft".

ISBN 0-7729-6270-7

1. Biology--Study and teaching (Secondary)--Ontario.
2. Biology--Ability and testing. I. Ontario. Ministry of Education. II. Title: Ontario assessment instrument pool.

QH316.024 1989 574'.076 C89-099669-5

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Ethology
 CURRICULAR EMPHASIS: Nature of Science
 KEYWORDS: teleology

INSTRUMENT CODE: B081AbMC.01
 GUIDELINE OBJECTIVE CODE: 81Ab
 INSTRUMENT TYPE: MC
 KLOPPER: A.1, A.2, A.3
 DIFFICULTY LEVEL: L
 TIME ALLOCATION:

Guideline Objective

Students will be encouraged to develop appreciation for the need to be objective in observing animal behaviour.

Item Focus

The student should be able to identify the danger in teleology.

Item

In the study of ethology, it is necessary to guard against teleology because it attempts to

- ☐ A. explain behaviour in directed terms.
- ☐ B. explain behaviour in human terms.
- ☐ C. oversimplify behaviour patterns.
- ☐ D. complicate behaviour patterns.
- ☐ E. provide a long term perspective.

Response/Marking Scheme

Correct response: A

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Experimental Design
CURRICULAR EMPHASIS: Nature of Science

INSTRUMENT CODE: B081SbMC.01
GUIDELINE OBJECTIVE CODE: 81Sb
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3, A.4, C.3, C.4
DIFFICULTY LEVEL: M
TIME ALLOCATION:

KEYWORDS: hypothesis taxis experimental design

Guideline Objective

Students will have the opportunity to develop skill in designing properly controlled investigations to test hypotheses concerning innate and learned behaviour of the animals available for study.

Item Focus

The student should be able to identify the design of an experiment that would best control a number of variables.

Item

A scientist wanted to test the hypothesis that sowbugs react negatively to light. Which of the following experiments would best test the hypothesis?

- ☐ A. Place 25 sowbugs into a lighted container and 25 into a darkened container. Count the numbers surviving in each container after 24 h.
- ☐ B. Place 25 sowbugs into a lighted container and leave them for 48 h. Then move them to a darkened container for 48 h. See which container the animals prefer.
- ☐ C. Place 25 sowbugs into a chamber that is half warm, moist, and dark, and half cool, dry, and bright. After 30 min, count the number of sowbugs in each half.
- ☐ D. Place 25 sowbugs into a container that is half lighted and half darkened. Be sure that both halves are at the same temperature and humidity. After 30 min, count the number of sowbugs in each half.
- ☐ E. Place 25 sowbugs into a container that is half lighted and half darkened. Be sure that the temperature and relative humidity are the same in each half. After 30 min, count the number of sowbugs in each half. Repeat 10 times, using different sowbugs.

Response/Marking Scheme

Correct response: E

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Types of Behaviour
 CURRICULAR EMPHASIS: Nature of Science
 KEYWORDS: taxis kinesis

INSTRUMENT CODE: B081SbMC.02
 GUIDELINE OBJECTIVE CODE: 81Sb
 INSTRUMENT TYPE: MC
 KLOPPER: A.2, A.3, D.3
 DIFFICULTY LEVEL: L
 TIME ALLOCATION:

Guideline Objective

Students will have the opportunity to develop skill in designing properly controlled investigations to test hypotheses concerning innate and learned behaviour of the animals available for study.

Item Focus

The student should be able to identify specific experimental evidence that would be useful in classifying animal behaviour.

Item

If you were given a choice chamber, which of the following procedures would best enable you to decide whether the response of an animal to two different light intensities were a taxis or a kinesis?

- ☐ A. Record the pathway of each animal.
- ☐ B. Count the number of individuals in each chamber at intervals.
- ☐ C. Switch one light off and record the position of individuals at intervals.
- ☐ D. Count the number of individuals moving and stationary at intervals.
- ☐ E. Record the position of individuals with eyes covered and with eyes uncovered at intervals.

Response/Marking Scheme

Correct response: A

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Characteristic Behaviours
 CURRICULAR EMPHASIS: Nature of Science

INSTRUMENT CODE: BO81ScLA.01
 GUIDELINE OBJECTIVE CODE: 81Sc
 INSTRUMENT TYPE: LA
 KLOPPER: A.1, A.2, A.3, A.9
 DIFFICULTY LEVEL: M
 TIME ALLOCATION:

KEYWORDS: trial and error learning graphical analysis

Guideline Objective

Students will have the opportunity to develop skill in accurately and objectively performing investigations and describing, recording, and interpreting data concerning animal behaviour.

Item Focus

The student should be able to graph and interpret the results of a laboratory investigation of animal behaviour.

Item

The following chart shows the time taken for a rat to complete a maze successfully in a series of trials.

TRIAL TIME(s)

1	123
2	118
3	112
4	95
5	95
6	96

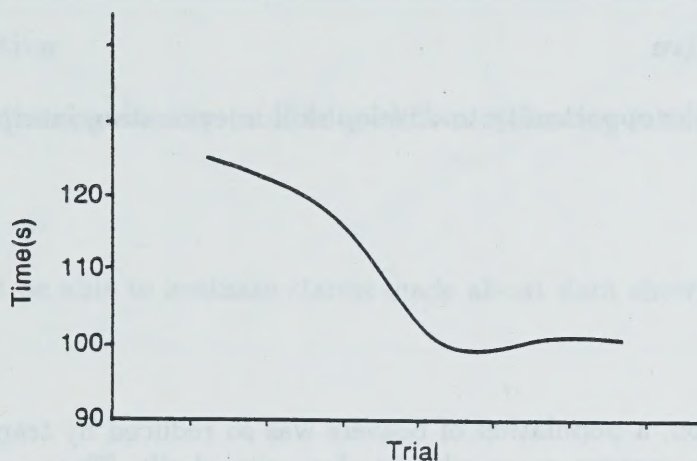
- Graph the results obtained and interpret the curve.
- What does the graph suggest about the nature of the behaviour shown by the rat?
- What conditions were likely used to train the rat?

Response/Marking Scheme

A.

Title 1

LEARNING BEHAVIOR OF A RAT



Axes 1

Labelling 1

Curve 1

The curve drops, showing that the rat takes less time to run the maze after each trial. Eventually, the curve flattens, showing that the rat achieved its level of competence.

2

- B. Since the rat did not originally display the behaviour and acquired this behaviour through running the maze, it is a learned behaviour which was acquired by trial and error, a type of conditioning.

1

1

1

The condition used to train the rats is a repeated running of the same maze with a positive reinforcement for a successful run.

1

Possible: 10

Maximum: 8

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Types of Behaviour
 CURRICULAR EMPHASIS: Solid Foundations
 KEYWORDS: instinct

INSTRUMENT CODE: B081SeMC.01
 GUIDELINE OBJECTIVE CODE: 81Se
 INSTRUMENT TYPE: MC
 KLOPPER: A.1, A.2, A.3, A.5, A.10
 DIFFICULTY LEVEL: L
 TIME ALLOCATION:

Guideline Objective

Students will have the opportunity to develop skill in evaluating interpretations of observed animal behaviour.

Item Focus

Same as above.

Item

In a particular region, a population of beavers was so reduced by trapping that only a few remained. For over a century, no new beaver dams were built. Then a new conservation area was created, and trapping ceased. The beaver population increased. Beavers started building new dams although none of the current population had ever seen dams being constructed. The kind of behaviour shown in the building of beaver dams is

- ☐ A. reflex.
- ☐ B. instinct.
- ☐ C. imprinting.
- ☐ D. conditioning.
- ☐ E. reasoning.

Response/Marking Scheme

Correct response: B

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Nature of Science

INSTRUMENT CODE: B081SeMA.01
GUIDELINE OBJECTIVE CODE: 81Se
INSTRUMENT TYPE: MA
KLOPPER: A.1, A.2, A.3, A.5, A.10, A.11
DIFFICULTY LEVEL: H
TIME ALLOCATION:

KEYWORDS: inference taxis reflex instinct reasoning graphical analysis

Guideline Objective

Students will have the opportunity to develop skill in evaluating interpretations of observed animal behaviour.

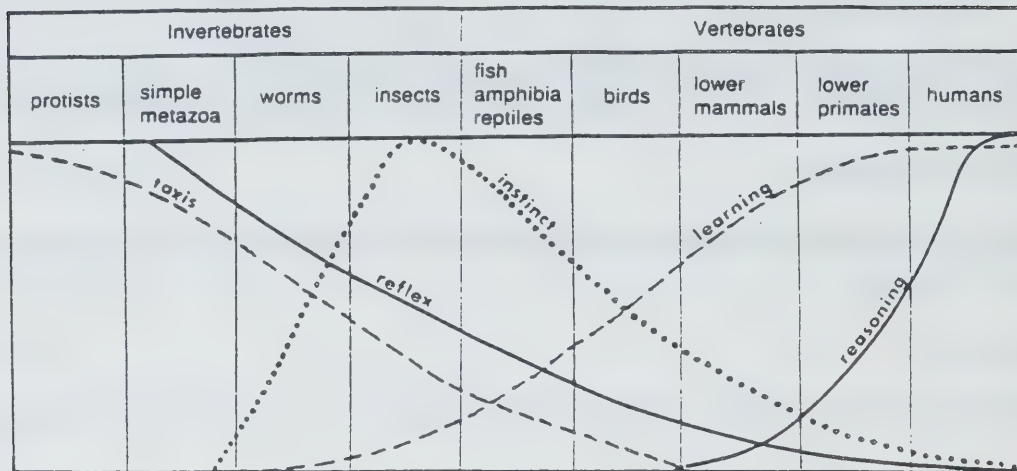
Item Focus

The student should be able to evaluate claims made about data shown graphically.

Item

Refer to Figure 8S.4.

DOMINANT BEHAVIOR PATTERNS



Source: Dether, V.G. and Stellar, E.
Animal Behaviour,
Prentice-Hall

Figure 8S.4 is an analysis of the dominant behaviour patterns shown by different groups of animals. Classify each of the statements that follow according to this key:

- KEY
- A. an inference supported by the graph.
 - B. an inference contradicted by the graph.
 - C. an inference neither supported nor contradicted by the graph.

STATEMENTS:

1. Mammals have more ways of responding to stimuli.
2. Organisms that reason must first learn and remember.
3. The simplest organisms usually respond at the taxis level.
4. A well developed brain is necessary for reasoning.
5. Reasoning is principally characteristic of humans, but is shared with other mammals, especially apes and monkeys.
6. In protists and simple metazoa, the reason that taxis is the principal type of behaviour is that responses are largely mediated by protoplasmic irritability.

7. In mammals many nerve pathways are left unused;these can be activated by learning experiences.
8. Animals with well developed nervous systems are capable of complex forms of behaviour, including learning and reasoning.

Response/Marking Scheme

1. B
2. C
3. A
4. A
5. A
6. C
7. C
8. A

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Animal Care Guidelines
CURRICULAR EMPHASIS: Nature of Science
KEYWORDS: animal care

INSTRUMENT CODE: B081KaMC.01
GUIDELINE OBJECTIVE CODE: 81Ka
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, I.4, I.5
DIFFICULTY LEVEL: M
TIME ALLOCATION:

Guideline Objective

Students will be expected to state the conditions required for the care of animals in the laboratory according to prescribed practice, for example, animals must be cared for humanely and handled properly, discomfort and pain must be minimized and the environments in which the animals are housed must be regulated to enhance the animals' welfare.

Item Focus

The student should be able to identify the purpose of the guidelines on animal care.

Item

The Canadian Council on Animal Care has published a guide for the care of experimental animals. The purposes of this guideline are to ensure that students, teachers and researchers

I provide humane care for and handling of animals.

II minimize pain and discomfort for experimental animals.

III avoid unnecessary use of animals.

IV provide adequate housing for experimental animals.

V provide regulated environments with uniform conditions.

Select your answer from

☐

A. I only.

☐

B. I and II only.

☐

C. I, II and III only.

☐

D. I, II, III, IV and V.

☐

E. III, IV and V only.

Response/Marking Scheme

Correct response: D

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Innate Behaviour
 CURRICULAR EMPHASIS: Nature of Science
 KEYWORDS: ethology behavioural psychology

INSTRUMENT CODE: B081KbER.01
 GUIDELINE OBJECTIVE CODE: 81Kb
 INSTRUMENT TYPE: ER
 KLOPPER: A.1, A.2, A.3, A.5, A.9
 DIFFICULTY LEVEL: L
 TIME ALLOCATION:

Guideline Objective

Students will be expected to describe and compare ethology, behavioural psychology and sociobiology.

Item Focus

Same as above.

Item

In the early part of this century, there were two schools of animal behaviour, differing in their views of the subject. Describe and compare ethology and behavioural psychology.

Response/Marking Scheme

Ethology is the scientific study of animal behaviour under natural conditions,	1
concentrating on behaviour typical of each species.	1
Behavioural psychology is the study of animal and human behaviour, concen-	
trating on the	1
mechanisms of the nervous system, such as reflexes.	1
Ethologists would observe species in their habitats, while behaviourists would	
experiment, manipulating the conditions.	2

Possible: 6

Maximum: 5

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Innate Behaviour
 CURRICULAR EMPHASIS: Nature of Science
 KEYWORDS: sociobiology

INSTRUMENT CODE: B081KbER.02
 GUIDELINE OBJECTIVE CODE: 81Kb
 INSTRUMENT TYPE: ER
 KLOPFER: A.1, A.2, A.3, A.5, A.9
 DIFFICULTY LEVEL: L
 TIME ALLOCATION:

Guideline Objective

Students will be expected to describe and compare ethology, behavioural psychology and sociobiology.

Item Focus

Same as above.

Item

In 1975, E.O. Wilson published a book, *Sociobiology, The New Synthesis* (Cambridge, Mass, Harvard University Press). What is the concept of sociobiology?

Response/Marking Scheme

Sociobiology suggests that human social behaviour	1
has been moulded in part by evolution, and	1
that genetics endows our brains with	1
tendencies and predisposition upon which	1
experience and social interaction build	1
patterns of complex behaviour.	1

Possible: 6

Maximum: 5

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Origins of Behaviours
CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KcER.01
GUIDELINE OBJECTIVE CODE: 81Kc
INSTRUMENT TYPE: ER
KLOPPER: A.1, A.2, A.3, A.5
DIFFICULTY LEVEL: L
TIME ALLOCATION:

KEYWORDS: learned behaviour innate behaviour

Guideline Objective

Students will be expected to, in terms of animal behaviour, compare innate with learned behaviour and the environmental (nurture) origins with the genetic (nature) origins of animal behaviour.

Item Focus

The student should be able to compare innate and learned behaviour.

Item

What are the similarities and differences between innate and learned behaviour?

Give two examples of each.

Response/Marking Scheme

Similarities:

both are forms of behaviour, that is, they consist of actions of organisms 2
in response to stimuli from their environment. 1

Differences:

Innate behaviour is genetically programmed into an 1
organism. That is, the responses to stimuli are automatic and predictable,
and do not have to be learned. 1

Any two examples: taxes, reflexes and instinct. 2

Learned behaviour is the result of experience, in which 1
particular responses to stimuli are developed in memory. 2

The capacity to learn behaviour is the result of genetically acquired charac-
teristics. 1

Any two examples: trial-and-error learning, conditioning, 2
imprinting, habituation and insight learning.

Possible: 13

Maximum: 8

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Origins of Behaviours
 CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KcER.02
 GUIDELINE OBJECTIVE CODE: 81Kc
 INSTRUMENT TYPE: ER
 KLOPFER: A.1, A.2, A.3, A.5
 DIFFICULTY LEVEL: M
 TIME ALLOCATION:

KEYWORDS: learned behaviour innate behaviour

Guideline Objective

Students will be expected to, in terms of animal behaviour, compare innate with learned behaviour and the environmental (nurture) origins with the genetic (nature) origins of animal behaviour.

Item Focus

The student should be able to compare animal behaviour which originates genetically with that which arises because of the environment.

Item

Animal behaviours are sometimes classified into those that are due to nature, and those due to nurture. Discuss the origins of behaviours due to genetics and to the environment. Give two examples of each kind of behaviour.

Response/Marking Scheme

Genetically based behaviours are those responses that are automatic and predictable,	2
and that do not need to be learned.	1
They include taxes, reflexes, and instincts (any two).	2
Behaviour resulting from the environment is a learned	1
behaviour, in which particular responses are developed	1
in memory. The capacity to learn behaviour is the result of genetically acquired characteristics.	1
Learned behaviour includes trial-and-error, conditioning imprinting, habituation and insight (any two).	2
Possible:	10

Maximum: 7

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU.1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: conditioning

INSTRUMENT CODE: B081KdMC.01
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify specific kinds of behaviour.

Item

Humans and some domestic animals respond to a specific name when they are called. This is an example of a class of behaviour termed

- ☐ A. imprinting.
- ☐ B. taxis.
- ☐ C. habituation.
- ☐ D. conditioning.
- ☐ E. insight.

Response/Marking Scheme

Correct response: D

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: instinct

INSTRUMENT CODE: B081KdMC.02
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify examples of specific kinds of behaviour.

Item

If you rapidly approach the nest of a bee or hornet too closely, the insects respond by flying quickly toward you and may sting you. This response is a type of behaviour termed

- ☐ A. taxis.
- ☐ B. imprinting.
- ☐ C. habituation.
- ☐ D. trial-and-error.
- ☐ E. instinct.

Response/Marking Scheme

Correct response: E

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology

LEVEL: OAC

UNIT NUMBER: OU 1

UNIT NAME: ANIMAL BEHAVIOUR

TOPIC: Types of Behaviour

CURRICULAR EMPHASIS: Solid Foundations

KEYWORDS: migration instinctive behaviour

INSTRUMENT CODE: B081KdMC.03

GUIDELINE OBJECTIVE CODE: 81Kd

INSTRUMENT TYPE: MC

KLOPPER: A.1, A.2, A.3

DIFFICULTY LEVEL: L

TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify the trigger of an instinctive behaviour.

Item

Bird migration, an instinctive behaviour, seems to be triggered by the effect of

- ☐ A. changes in duration of darkness on endocrine glands.
- ☐ B. changes in duration of light on the medulla.
- ☐ C. changes in available food supply.
- ☐ D. changes in temperature on hormone levels.
- ☐ E. changing population sizes.

Response/Marking Scheme

Correct response: A

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: learned behaviour

INSTRUMENT CODE: B081KdMC.04
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify an example of a particular type of behaviour.

Item

"Mary had a little lamb, its fleece was white as snow, and everywhere that Mary went, her lamb was sure to go."

Which of the following terms best applies to the description of the behaviour of Mary's lamb?

☐ A. learned behaviour

☐ B. taxis

☐ C. reflex

☐ D. trial and error

☐ E. habituation

Response/Marking Scheme

Correct response: A

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: reflex

INSTRUMENT CODE: B081KdMC.05
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify a type of behaviour from its description.

Item

The quick withdrawal of your hand, when you touch something hot, is an example of

- ☐ A. a conditioned reflex.
- ☐ B. a reflex.
- ☐ C. poor accommodation.
- ☐ D. a voluntary action.
- ☐ E. innate behaviour.

Response/Marking Scheme

Correct response: B

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: instinct

INSTRUMENT CODE: B081KdMC.06
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify a type of behaviour from its description.

Item

The honey-making behaviour of bees, and the web-spinning behaviour of spiders are examples of

- ☐ A. habits.
- ☐ B. planning.
- ☐ C. conditioned reflexes.
- ☐ D. instincts.
- ☐ E. tropisms.

Response/Marking Scheme

Correct response: D

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: reflex

INSTRUMENT CODE: B081KdMC.07
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify a type of behaviour from its description.

Item

Blinking, caused by something in the eye, is an example of

- ☐ A. a conditioned reflex.
- ☐ B. a habit.
- ☐ C. a simple reflex.
- ☐ D. a tropism.
- ☐ E. imprinting.

Response/Marking Scheme

Correct response: C

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: conditioned reflex

INSTRUMENT CODE: B081KdMC.08
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify an example of a particular type of behaviour.

Item

Which of the following is an example of a conditioned reflex?

- ☐ A. the crying of a newborn infant.
- ☐ B. the flow of saliva at the sound of the lunch bell.
- ☐ C. typing a letter without looking at the keyboard.
- ☐ D. walking.
- ☐ E. memorizing a poem.

Response/Marking Scheme

Correct response: B

Teacher Notes

DRAFT

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Instinctive Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: instinct

INSTRUMENT CODE: B081KdMC.09
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3, A.6
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify a type of behaviour from its description.

Item

When a parent herring gull gives an alarm call, and the young birds respond by hiding, what type of behaviour is that of the young birds?

- ☐ A. taxis
- ☐ B. imprinting
- ☐ C. instinct
- ☐ D. habituation
- ☐ E. conditioning

Response/Marking Scheme

Correct response: C

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: behaviour taxis

INSTRUMENT CODE: B081KdMC.10
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3,
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify the lowest level of behaviour patterns.

Item

The lowest level of the following terms used to describe behaviour is

- ☐ A. reflex.
- ☐ B. imprinting.
- ☐ C. taxis.
- ☐ D. learning.
- ☐ E. instinct.

Response/Marking Scheme

Correct response: C

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: conditioning

INSTRUMENT CODE: B081KdMC.11
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3, A.6
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify the difference between two types of behaviour.

Item

Trial and error learning (operant conditioning) differs from conditioned reflex learning (involuntary conditioning) in that

- ☐ A. one stimulus is substituted for another.
- ☐ B. the behaviour is initially spontaneous.
- ☐ C. in the absence of reward, it will gradually become extinct.
- ☐ D. it does not involve true learning.
- ☐ E. the behaviour can be reinforced by reward.

Response/Marking Scheme

Correct response: B

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Types of Behaviour
 CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KdER.01
 GUIDELINE OBJECTIVE CODE: 81Kd
 INSTRUMENT TYPE: ER
 KLOPPER: A.1, A.2, A.3
 DIFFICULTY LEVEL: L
 TIME ALLOCATION:

KEYWORDS: learning trial and error learning

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to describe the steps leading to unlearning a simple task.

Item

An animal has been trained by trial and error to perform a simple task successfully. How is it possible to cause it to “unlearn” this behaviour?

Response/Marking Scheme

If the “reward” resulting from the desired behaviour is removed	1
or replaced with negative reinforcement,	1
the organism will cease to perform the task successfully. Also, if not repeated	
for a long period of time, the behaviour may be extinguished.	1
	Possible: 3

Maximum: 3

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: behaviour

INSTRUMENT CODE: B081KdER.02
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: ER
KLOPPER: A.1, A.2, A.5, A.10, A.11
DIFFICULTY LEVEL: M
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify behaviours and outline their characteristics.

Item

For each of the following, name the type of behaviour and explain why it is that type.

- A. A flatworm will climb up a tube. If the tube is inverted, the worm will turn around and crawl upwards again.
- B. A male zebra finch, hatched by a Bengalese finch, if later placed with females of both species, will show preference to the female Bengalese finches.
- C. A dog always came to the kitchen when the electric can opener was run as long as it was fed canned dog food. Once the owner switched to dry dog food, the dog eventually stopped coming when the can opener was run.
- D. A person who moved close to a railroad, eventually stopped waking up when the trains went by at night.

Response/Marking Scheme

- A. Negative Geotaxis: The worm is moving away from the centre of the earth. 2
- B. Imprinting: The zebra finch directed his sexual activity towards the species he first encountered during his sensitive period.
This behaviour maintained itself (irreversible). 2
- C. Extinction: An initial behaviour was acquired by conditioning a response followed by a reinforcement.
Once the reinforcement was removed, the behaviour eventually ceased. 2
- D. Habituation: Here the individual learned not to respond to a stimulus that remained constant. 2

Possible: 8

Maximum: 8

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: imprinting

INSTRUMENT CODE: B081KdER.03
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: ER
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to describe different types of behaviour.

Item

In what way does imprinting differ from all other forms of behaviour?

Response/Marking Scheme

Imprinting is under internal control (predetermined genetically)	1
and the behaviour will elicit itself only if the stimulus is received during a certain phase in development.	1
Imprinting is also irreversible	1
and is evident particularly in birds.	1
Possible:	4

Maximum: 4

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KdER.04
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: ER
KLOPPER: A.1, A.2, A.3, A.9
DIFFICULTY LEVEL: M
TIME ALLOCATION:

KEYWORDS: tropism learning conditioning habituation extinction

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to distinguish between different types of behaviour.

Item

Distinguish between the following groups of terms and give an example of each.

- A. taxis and tropism
- B. learning and conditioning
- C. habituation and extinction

Response/Marking Scheme

- A. Taxis and tropism are both behaviour patterns towards or away from an environmental gradient. The difference between the two, is that taxis involves locomotion, whereas tropism in plants is achieved by growth. 2

Two examples 2

- B. Learning is a form of behaviour in which a behavioural response is altered because of an experience. Conditioning is one form of a learned behaviour where the response to a stimulus is altered by the presence of another stimulus. 2

Two examples 2

- C. Both habituation and extinction are the ceasing of a behavioural pattern. In habituation, the stimulus, which is not significant or harmful, is ignored. Extinction is the gradual loss of an acquired response, caused when the nervous system fails to respond to a stimulus. 2

Two examples 2

Possible: 12

Maximum: 12

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KdER.05
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: ER
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: M
TIME ALLOCATION:

KEYWORDS: pheromone taxis anthropomorphism reinforcement

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify and explain terms related to the study of behaviour.

Item

Explain the meaning of each of the following, and how each relates to the study of animal behaviour:

- A. pheromone
- B. taxis
- C. anthropomorphism
- D. reinforcement

Response/Marking Scheme

- | | |
|---|---|
| A. A pheromone is a chemical that serves as a species specific behavioural releaser. | 2 |
| B. A taxis is a simple form of behaviour that involves continuous, oriented movement of an organism towards or away from an environmental stimulus. | 2 |
| C. Anthropomorphism is a form of interpretation that manifests itself in behaviour studies when the observer (or interpreter) interprets the response of another animal in human terms (motivations, behaviours). | 2 |
| D. Reinforcement is a stimulus (reward, action) that is used to modify a response of an animal by causing a fixed action pattern. | 2 |

Possible: 8

Maximum: 8

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Types of Behaviour
 CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KdMA.01
 GUIDELINE OBJECTIVE CODE: 81Kd
 INSTRUMENT TYPE: MA
 KLOPPER: A.1, A.2, A.5
 DIFFICULTY LEVEL: M
 TIME ALLOCATION:

KEYWORDS: taxis reflex instinct imprinting habituation

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to match the terms used to describe specific behaviours with their definitions.

Item

Match the terms in the left column with the appropriate definitions by inserting the letter of the definition in the blank to the left of the terms.

- | | |
|---------------------|---|
| 1. ____ taxis | A. a rigid, predictable pattern of response that always follows a given stimulus. |
| 2. ____ reflex | B. a decrease in a behavioural response that occurs when the same stimulus is encountered frequently. |
| 3. ____ instinct | C. a response to a stimulus by movement in a particular direction, either toward or away from the stimulus. |
| 4. ____ imprinting | D. an automatic, protective response to a stimulus, usually effected by only 2 or 3 neurons. |
| 5. ____ habituation | E. a kind of learned response to new stimuli not previously met in terms of prior experiences. |
| | F. a form of learning that occurs at only a brief period of an animal's life. |

Response/Marking Scheme

Correct responses:

1. - C, 2. - D, 3. - A, 4. - F, 5. - B.

Maximum: 5

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Types of Behaviour
 CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KdMA.02
 GUIDELINE OBJECTIVE CODE: 81Kd
 INSTRUMENT TYPE: MA
 KLOPPER: A.1, A.2, A.5
 DIFFICULTY LEVEL: M
 TIME ALLOCATION:

KEYWORDS: taxis reflex instinct imprinting habituation

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify the terms used for specific behaviours with descriptions of the behaviours.

Item

Match the terms in the left column with descriptions of particular behaviours from the right column by inserting the appropriate letter in the blanks to the left of the terms.

- | | |
|----------------------------|--|
| <p>1. ____ taxis</p> | <p>A. Partridges, soon after hatching, will follow for their lifetime the first moving object they see.</p> |
| <p>2. ____ reflex</p> | <p>B. An amoeba extends pseudopods and moves toward any small protist that swims nearby.</p> |
| <p>3. ____ instinct</p> | <p>C. After you live near an airport or a railway for a time, you fail to hear the planes or trains.</p> |
| <p>4. ____ imprinting</p> | <p>D. A chimpanzee without prior experience learned to reach some bananas by stacking two boxes and using a stick.</p> |
| <p>5. ____ habituation</p> | <p>E. A red-winged blackbird that has established its nesting territory will fly at any intruding male, puffing up its red wing patches and uttering a loud cry.</p> |
| | <p>F. A rapid movement near your face causes you to blink.</p> |

Response/Marking Scheme

Correct responses:

1. - B, 2. - F, 3. - E, 4. - A, 5. - C.

Maximum: 5

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Types of Behaviour
 CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KdMA.03
 GUIDELINE OBJECTIVE CODE: 81Kd
 INSTRUMENT TYPE: MA
 KLOPPER: A.1, A.2, A.3, A.6
 DIFFICULTY LEVEL: M
 TIME ALLOCATION:

KEYWORDS: imprinting taxis reflex fixed action pattern habituation
 sign stimulus trial and error learning conditioned reflex

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify the names of types of behaviour with descriptions of characteristic behaviours.

Item

Select the letter from the description of a behaviour in the column on the right, and insert it in the blank next to the appropriate term in the left column.

- | | |
|----------------------------------|--|
| 1. ____ imprinting | A. A newly hatched chick will crouch down when a duck flies over; after a few weeks it ignores the duck. |
| 2. ____ taxis | B. Pavlov's dogs began to salivate when a bell rang. |
| 3. ____ reflex action | C. Your signature looks almost the same every time you write it. |
| 4. ____ conditioned reflex | D. A newly hatched duck will follow a wind-up toy as if it were its mother. |
| 5. ____ habituation | E. When your patellar tendon is tapped, your lower leg kicks. |
| 6. ____ sign stimulus | F. The black spot on the beak of a herring gull appears to cause the pecking response of a gull chick. |
| 7. ____ trial and error learning | G. In an experiment, a pigeon selects the correct response from among three choices in order to obtain food. |
| | H. A paramecium moves away from a saline solution. |

Response/Marking Scheme

Correct responses:

1 - D; 2 - H; 3 - E; 4 - B; 5 - A; 6 - F; 7 - G.

Maximum: 7

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology

LEVEL: OAC

UNIT NUMBER: OU 1

UNIT NAME: ANIMAL BEHAVIOUR

TOPIC: Types of Behaviour

CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KdMA.04

GUIDELINE OBJECTIVE CODE: 81Kd

INSTRUMENT TYPE: MA

KLOPPER: A.1, A.2, A.3, A.5

DIFFICULTY LEVEL: M

TIME ALLOCATION:

KEYWORDS: instinct trial and error learning conditioning taxis insight

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to match terms used in ethology with examples of specific behaviour.

Item

Insert in the blanks the number of the term from the right column of the behaviour that best fits the example in the left column.

- | | | |
|------|--|--------------------|
| A. — | Gerbils shred newspaper into tiny bits to form a nest. | 1. taxis |
| B. — | Protists swim towards food. | 2. reflex |
| C. — | Ducks follow their mother soon after hatching. | 3. instinct |
| D. — | A toad ate robber flies which it caught by flicking out its tongue. When it tried to catch a bee, it was stung. The toad no longer catches robber flies. | 4. trial and error |
| E. — | Doves exhibit a standard pattern of behaviour during courtship. | 5. conditioning |
| | | 6. insight |
| | | 7. imprinting |

Response/Marking Scheme

A - 3, B - 1, C - 7, D - 5, E - 3.

Maximum: 5

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Learned Behaviour
CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KdSA.01
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: SA
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: L
TIME ALLOCATION:

KEYWORDS: reinforcement stimulus conditioning sensitive period releasers

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to describe different types of behaviour.

Item

Define and give an example of each of the following terms:

- A. reinforcement
- B. stimulus
- C. conditioning
- D. sensitive period
- E. behavioural releasers

Response/Marking Scheme

- A. Reinforcement is a condition that is received or experienced as a result of a particular behaviour. It can be positive in nature, in which case it encourages a continuation of the behaviour, or negative, resulting in the cessation of the behaviour. 1
Any example: 1
- B. A stimulus is a condition or situation that triggers a particular behavioural response. 1
Any example: 1
- C. Conditioning refers to a type of behaviour in which an organism is trained to respond to a particular stimulus in a particular way. 1
Any example: 1
- D. Sensitive period is a critical time frame during which certain animals are responsive to certain stimuli. Once the time frame has been passed, the stimulus no longer triggers the response. 1
Any example: 1
- E. Behavioural releasers are certain conditions that initiate specific behavioural patterns. 1
Any example: 1
Possible: 11
Maximum: 10

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology

LEVEL: OAC

UNIT NUMBER: OU 1

UNIT NAME: ANIMAL BEHAVIOUR

TOPIC: Learned Behaviour

CURRICULAR EMPHASIS: Solid Foundations

KEYWORDS: reinforcement habituation rewards extinction

INSTRUMENT CODE: B081KdSA.02

GUIDELINE OBJECTIVE CODE: 81Kd

INSTRUMENT TYPE: SA

KLOPPER: A.1, A.2, A.3

DIFFICULTY LEVEL: M

TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to describe different types of behaviour.

Item

State the similarities and differences between the following pairs of terms:

A. habituation and extinction

B. reward and reinforcement

Response/Marking Scheme

A. habituation and extinction:

Similarity: both are a discontinuation of a particular behavioural pattern. 1

Difference: the discontinuation of habituation is a result of continued exposure to a stimulus which has no negative effects, while extinction is a result of failure to receive reinforcement for a particular response. 2

B. reward and reinforcement:

Similarity: both are conditions that encourage a desired response. 1

Difference: a reward is always positive while reinforcement may be positive or negative. 2

Possible: 6

Maximum: 6

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KdSA.05
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: SA
KLOPPER: A.1, A.2, A.3, A.10
DIFFICULTY LEVEL: M
TIME ALLOCATION:

KEYWORDS: taxis learning habituation

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to classify types of behaviour and justify the classification.

Item

Identify the following types of behaviour and for each, explain your answer:

- A. A *Euglena* moves away from bright light.
- B. A rat improves its running time in a maze.
- C. After one month in a new home, a person no longer hears the trains that pass close to the house.

Response/Marking Scheme

A. Taxis (Negative Phototaxis)

1

This is a taxis because it involves the movement of an organism in response to a stimulus in the environment.

2

B. Learning (Trial and Error)

1

The rat is learning because it is altering its behaviour as a result of its experience. It is trial and error because it is repeating an act that is rewarded.

2

C. Learning (Habituation)

1

The person is learning because he/she is altering his/her behaviour as a result of an experience. It is habituation because the subject is learning NOT to respond to a stimulus.

2

Maximum: 9

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology

LEVEL: OAC

UNIT NUMBER: OU 1

UNIT NAME: ANIMAL BEHAVIOUR

TOPIC: Types of Behaviour

CURRICULAR EMPHASIS: Solid Foundations

KEYWORDS: pecking order social behaviour

INSTRUMENT CODE: B081KdSA.06

GUIDELINE OBJECTIVE CODE: 81Kd

INSTRUMENT TYPE: SA

KLOPPER: A.1, A.2, A.3, D.3

DIFFICULTY LEVEL: M

TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify a specified bird in a pecking order, given observations of the behaviour of the flock.

Item

The letters in the list below represent individuals in a flock of hens, in which one bird is dominant in the pecking order, and one bird is lowest in the order.

X is pecked by U

V is pecked by X

Y pecked V

T pecked W and U

U pecked Z

X pecked T

Z pecked W

V pecked Z

Identify the dominant hen, and the lowest hen in the pecking order. Give reasons for your answers.

Response/Marking Scheme

Y is dominant, since it is not pecked by any other bird. 2

W is lowest, since it is pecked by 2 birds, and does not peck any others. 2

Maximum: 4

Teacher Notes

DRAFT

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Nature of Science

INSTRUMENT CODE: B081KdSA.07
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: SA
KLOPFER: A.1, A.2, A.3, A.6, A:10
DIFFICULTY LEVEL: M
TIME ALLOCATION:

KEYWORDS: learning taxis reasoning instinct reflex graphical analysis

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify different groups of animals with characteristic types of behaviour.

Item

Refer to Figure 8K.1.

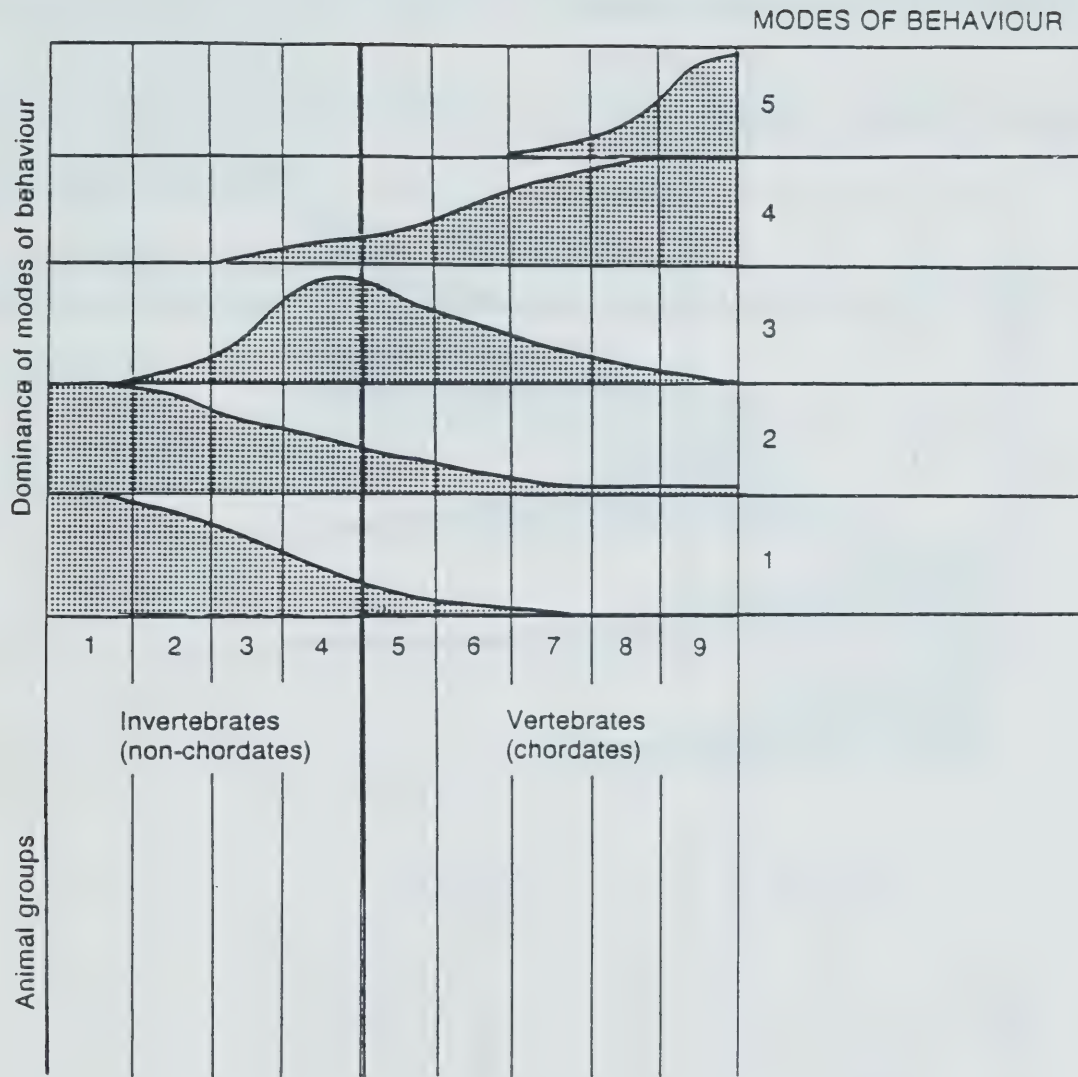


Figure adapted from: Dethier, V.G. and Stellar E.,
Animal Behaviour,
 Prentice Hall.

Figure 8K.1 represents graphically the relative dominance of different modes of behaviour in the lives of different groups of animals, according to one hypothesis.

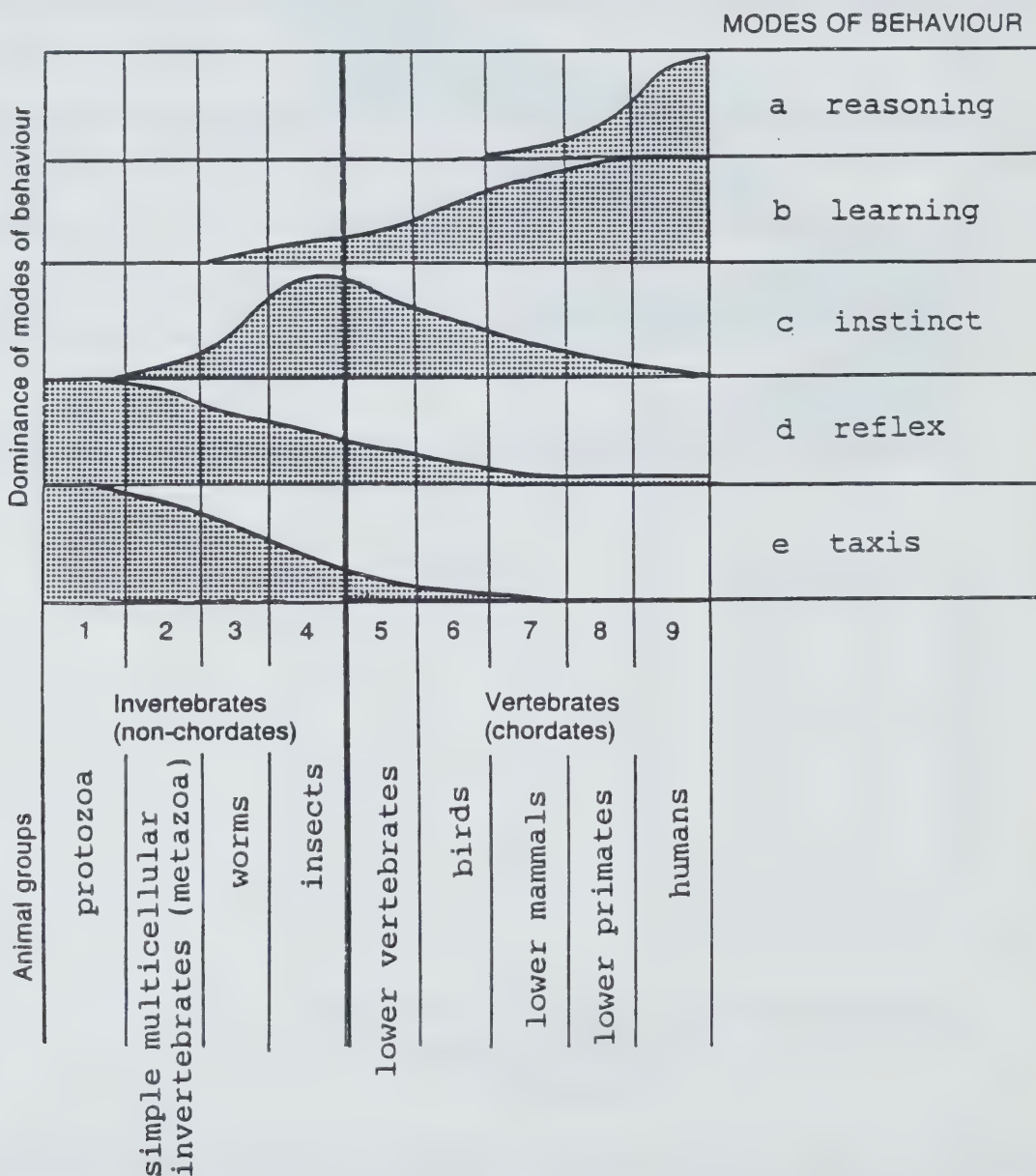
- A. Identify the types of behaviour from the list below, and label these types on the vertical axis, opposite the appropriate letters from a to e.

Modes of Behaviour: learning, taxes, reasoning, instinct, reflex.

B. Identify the groups of animals from the list below, and write their names on the horizontal axis to correspond with the appropriate numbers, from 1 to 9.

Groups of Animals: lower mammals, worms, humans, insects, protozoa, birds, lower vertebrates (fish, amphibians, reptiles), simple multicellular invertebrates (metazoa), lower primates.

Response/Marking Scheme



Maximum: 14

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Types of Behaviour
CURRICULAR EMPHASIS: Nature of Science

INSTRUMENT CODE: B081KdSA.08
GUIDELINE OBJECTIVE CODE: 81Kd
INSTRUMENT TYPE: SA
KLOPPER: A.1, A.2, A.3, A.10, D.3
DIFFICULTY LEVEL: M
TIME ALLOCATION:

KEYWORDS: conditioned reflex stimulus graphical analysis

Guideline Objective

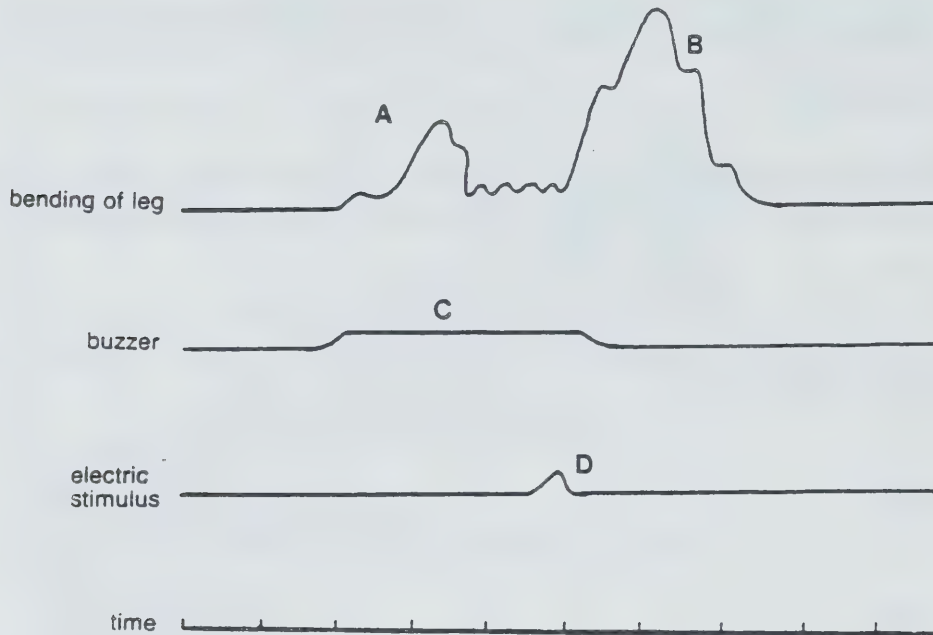
Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to identify a conditioned reflex from a graph of stimulus/response, and explain how it was initiated.

Item

A conditioned reflex was developed in a dog by first applying a mild electric shock to its foot, causing the leg to bend. This stimulus was associated by repetition with the sound of a buzzer which preceded the shock. Refer to Figure 8K.2, a tracing of the response patterns of a series of treatments.



- A. Which letter on the tracing represents the conditioned reflex?
- B. Identify which letter on the tracing represents each of the following?
- unconditioned stimulus
 - conditioned stimulus
 - unconditioned reflex
- C. Describe how the conditioned reflex was achieved.

Response/Marking Scheme

A. The conditioned reflex is A.	1
B. B represents the unconditioned reflex.	1
C is the conditioned stimulus.	1
D is the unconditioned stimulus.	1
C. The traces show the process while the conditioned reflex was being established,	1
since D was still being applied to produce B.	1
The start of the buzzer (C) produced A.	1
Eventually D could be omitted, and the conditioned reflex (A) would be demonstrated by C and A alone.	2

Possible: 9

Maximum: 8

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Types of Behaviour
 CURRICULAR EMPHASIS: Solid Foundations
 KEYWORDS: learned behaviour

INSTRUMENT CODE: B081KdSA.09
 GUIDELINE OBJECTIVE CODE: 81Kd
 INSTRUMENT TYPE: SA
 KLOPPER: A.1, A.2
 DIFFICULTY LEVEL: L
 TIME ALLOCATION:

Guideline Objective

Students will be expected to describe an example of and be able to identify each of the following kinds of behaviour: taxis, reflex, instinct, imprinting, habituation, conditioning.

Item Focus

The student should be able to name and describe different types of learned behaviour.

Item

Name and describe three types of learned behaviour.

Response/Marking Scheme

(any 3 of the following @ 3 marks)

<u>Habituation</u> is a gradual decline in an old response	1
due to lack of reinforcement.	2
<u>Conditioning</u> is the associating of a response with a particular stimulus	1
with which it was not previously associated.	2
<u>Trial and Error</u> is the repeating of a particular response that is found to be	
rewarding	1
and discontinuing non-rewarding responses.	2
<u>Imprinting</u> is the formation of a bond as a result of a stimulus	1
which occurs during a critical period, usually early in an animal's life.	2
<u>Insight (Reasoning)</u> is the ability to apply responses	1
learned in other situations to a new situation	2

Maximum: 9

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Learned Behaviour
CURRICULAR EMPHASIS: Nature of Science
KEYWORDS: operant conditioning

INSTRUMENT CODE: B081KeMC.01
GUIDELINE OBJECTIVE CODE: 81Ke
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3, A.5
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe how animal behaviour can be modified through basic and operant conditioning techniques, including the use of positive and negative reinforcement and the use of mind-altering chemicals.

Item Focus

The student should be able to identify basic operant conditioning techniques.

Item

In the 1930's, Skinner developed a box for the laboratory study of animal behaviour. Whenever the animal learned to make a desired response to a stimulus, it was given a pellet of food. The term for such an investigation is

- ☐ A. behavioural psychology.
- ☐ B. operant conditioning.
- ☐ C. negative reinforcement.
- ☐ D. ethology.
- ☐ E. sociobiology.

Response/Marking Scheme

Correct response: B

Teacher Notes

DRAFT

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Learned Behaviour
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: operant conditioning

INSTRUMENT CODE: B081KeER.01
GUIDELINE OBJECTIVE CODE: 81Ke
INSTRUMENT TYPE: ER
KLOPPER: A.1, A.2, A.3, A.5
DIFFICULTY LEVEL: M
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe how animal behaviour can be modified through basic and operant conditioning techniques, including the use of positive and negative reinforcement and the use of mind-altering chemicals.

Item Focus

Same as above.

Item

Describe how animal behaviour can be modified using operant conditioning techniques.

Response/Marking Scheme

The behaviour of the animal must be monitored closely.	1
Whenever it begins to make a desired response,	1
it is given positive reinforcement	1
in the form of a food pellet or other reward.	1
After time, the reinforcement can be made randomly, and reward is given for several steps at a time, instead of just one.	2
Eventually, the animal will make a series of actions that combine to produce the desired behaviour.	1

Possible: 7

Maximum: 5

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology

LEVEL: OAC

UNIT NUMBER: OU 1

UNIT NAME: ANIMAL BEHAVIOUR

TOPIC: Ethology

CURRICULAR EMPHASIS: Solid Foundations

KEYWORDS: imprinting innate behaviour

INSTRUMENT CODE: B081KfMC.01

GUIDELINE OBJECTIVE CODE: 81Kf

INSTRUMENT TYPE: MC

KLOPPER: A.1, A.2, A.3

DIFFICULTY LEVEL: L

TIME ALLOCATION:

Guideline Objective

Students will be expected to briefly describe the ethological work and findings of individuals such as Lorenz, Tinbergen, von Frisch, and Goodall.

Item Focus

The student should be able to identify an example of imprinting.

Item

Newly hatched ducklings follow the first moving object they see. This is the result of

- ☐ A. reasoning.
- ☐ B. parental affection.
- ☐ C. instinct.
- ☐ D. imprinting.
- ☐ E. biological drive.

Response/Marking Scheme

Correct response: D

Teacher Notes

DRAFT

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR.
TOPIC: Contributions of Scientists
CURRICULAR EMPHASIS: Nature of Science
KEYWORDS: von Frisch honey bees

INSTRUMENT CODE: B081KfER.01R
GUIDELINE OBJECTIVE CODE: 81Kf
INSTRUMENT TYPE: ER(R)
KLOPPER: A.1, A.2, A.3, A.6, A.7, I.3
DIFFICULTY LEVEL: M
TIME ALLOCATION:

Guideline Objective

Students will be expected to briefly describe the ethological work and findings of individuals such as Lorenz, Tinbergen, von Frisch, and Goodall.

Item Focus

Objective as above.

Item

With the aid of simple diagrams, describe the contribution made by Karl von Frisch to our knowledge and understanding of behaviour of bees.

Response/Marking Scheme

Von Frisch studied methods by which honey bees communicate the location of a food source to the other bees in the hive.

1

This is achieved as follows: foraging worker bees return to the hive from a source of food and perform dances on the surface of the honeycomb.

1

Together with scent and sound, the dances direct the other bees to the food source.

2

The “round dance” is

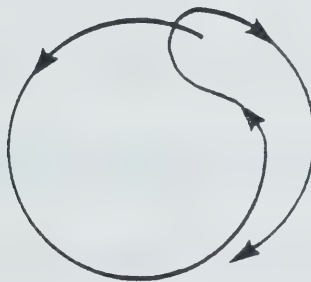
performed when the food is relatively close (within 85 m of the hive).

1

Diagram A

“round dance”

1



For sources further away from the hive, the “waggle dance” is performed.

1

The dance is performed on the vertical face of the comb.

1

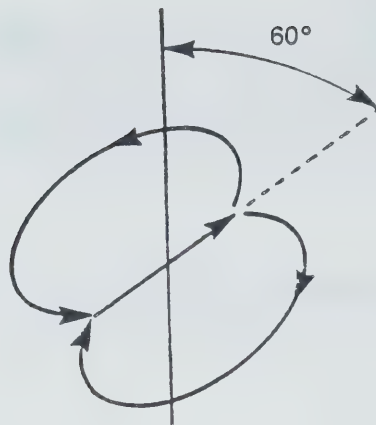
The bee waggles abdomen on straight run (dark diagonal arrow in Diagram B) and then turns right or left.

2

Diagram B

"waggle dance"

1



The distance of the food source from the hive is indicated by the number of turns in the dance in a given time.

1

The richness of the food source is indicated by the vigour and duration of the dance.

1

The direction of the food — the vertical direction represents the sun's position (See Diagram C).

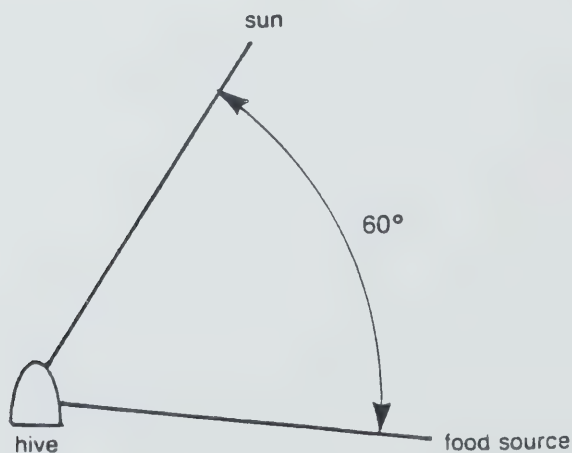
1

The angle between the sun's direction and the food source is indicated by the angle between the straight part of the dance and the vertical direction.

2

Diagram C

1



Possible: 17

Maximum: 12

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Contributions of Scientists
CURRICULAR EMPHASIS: Nature of Science

INSTRUMENT CODE: B081KfER.02R
GUIDELINE OBJECTIVE CODE: 81Kf
INSTRUMENT TYPE: ER(R)
KLOPPER: A.1, A.2, A.6, A.7, I.3
DIFFICULTY LEVEL: M
TIME ALLOCATION:

KEYWORDS: Lorenz Tinbergen Goodall

Guideline Objective

Students will be expected to briefly describe the ethological work and findings of individuals such as Lorenz, Tinbergen, von Frisch, and Goodall.

Item Focus

Objective as above.

Item

Select two of the following scientists and for each, give a brief account of one contribution made to our understanding of behaviour.

Lorenz
Tinbergen
Goodall

Response/Marking Scheme

K. Lorenz

He investigated behaviour of fledglings, which are able to walk and feed as soon as they hatch, and	1
found that they instinctively follow the first moving object they see after hatching.	1
This is usually the parent bird, however, Lorenz found that the behaviour could be illustrated using different objects (including himself!).	1
This form of behaviour is called <u>imprinting</u> .	1
It appears to be a genetically determined behaviour pattern, a very rapid form of learning,	1
which requires a particular stimulus at a critical period in the animal's development to be completed.	2
Possible:	7
Maximum:	5

N. Tinbergen

He worked with sticklebacks to investigate the properties of releasing stimuli.	1
Releasing stimuli are stimuli selected from all of the possible environmental stimuli by the innate releasing mechanism which then initiates a fixed action pattern of behaviour.	1
By releasing several models of varying shapes, sizes and colours, Tinbergen found that during breeding season, the aggressive behaviour of one male stickleback to another male was simply a response to a red belly.	2
The red belly proved to be the releasing stimulus.	1
He also found that the complex series of behaviour patterns in the courtship of sticklebacks is, in fact, a chain of stimuli and responses.	1
Each response is the stimulus that sets off the next event.	1
The behaviour pattern was maintained by a series of releasing stimuli.	1
In this case, the behaviour of the male provided the releasing stimulus for the next step in the female's behaviour leading to a series of reciprocal activities.	1
Possible:	9
Maximum:	5

J. Goodall

She studied chimpanzees	1
in their natural habitats in Africa (Tanzania).	1
She observed that they use sticks as tools to get food.	2
She studied social structure and behaviour and	2
discovered that chimpanzees are carnivores as well as herbivores.	1
Possible:	7

Maximum: 5

Teacher Notes

DRAFT

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Contributions of Scientists
CURRICULAR EMPHASIS: Nature of Science

INSTRUMENT CODE: B081KfMA.01
GUIDELINE OBJECTIVE CODE: 81Kf
INSTRUMENT TYPE: MA
KLOPPER: A.1, A.2, I.3
DIFFICULTY LEVEL: L
TIME ALLOCATION:

KEYWORDS: Lorenz Tinbergen von Frisch

Guideline Objective

Students will be expected to briefly describe the ethological work and findings of individuals such as Lorenz, Tinbergen, von Frisch, and Goodall.

Item Focus

The student should be able to match the name of a scientist with the type of behaviour for which he is known, and the animal with which he experimented.

Item

The science of ethology was largely pioneered by Konrad Lorenz; Niko Tinbergen; Karl von Frisch; Jane Goodall

In the table below, match the scientists listed above with the animal and the type of behaviour with which their work is associated.

Types of Behaviour: communication, imprinting, tool using, aggression.

Animals Studied: chimpanzees, bees, sticklebacks, ducks.

SCIENTIST	TYPE OF BEHAVIOUR	ANIMAL
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Lorenz

Tinbergen

von Frisch

Goodall

Response/Marking Scheme

SCIENTIST	TYPE OF BEHAVIOUR	ANIMAL
Lorenz	imprinting	ducks
Tinbergen	aggression	sticklebacks
von Frisch	communication	bees
Goodall	tool using	chimpanzees

Maximum: 8

Teacher Notes

DRAFT

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Contributions of Scientists
CURRICULAR EMPHASIS: Nature of Science
KEYWORDS: von Frisch bee dances

INSTRUMENT CODE: B081KfSA.01R
GUIDELINE OBJECTIVE CODE: 81Kf
INSTRUMENT TYPE: SA
KLOPPER: A.1, A.2, A.3, A.9, A.11
DIFFICULTY LEVEL: M
TIME ALLOCATION:

Guideline Objective

Students will be expected to briefly describe the ethological work and findings of individuals such as Lorenz, Tinbergen, von Frisch, and Goodall.

Item Focus

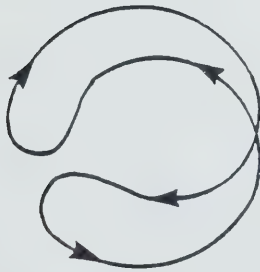
The student should be able to describe the discoveries of K. von Frisch regarding communication among bees.

Item

Refer to Figure 8K.4.

The figures represent patterns of dances performed in the hive by a returning foraging bee. In the spaces provided to the right of the diagrams, describe Karl von Frisch's interpretations in terms of bee communication:

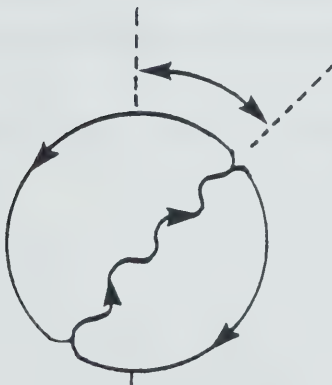
1. State the information given to other bees;
2. Interpret the movements of the dance relate to the food source;
3. Using the symbols: H = beehive, S = sun, F = food source, $\longrightarrow$ = flight path of the bee, draw diagrams in parts B. and C. to show the flight of a bee to the food source.



A. 1.

2.

A. round dance of worker bee on vertical face of comb



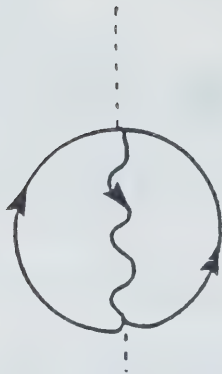
B. 1.

2.

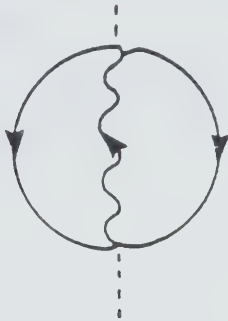
3.

B. waggle dance on vertical face of comb

C.



waggle dance made directly down or up on the comb



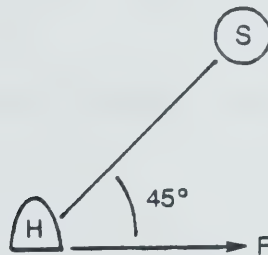
C. 1.

2.

3.

Response/Marking Scheme

- A. 1. The source of the food is near the hive, within 70 - 80 m. 1
2. The dance suggests "look around the hive". 1
- B. 1. The number of waggles and the speed of the dance give information about the distance of the food source. 2
The orientation of the dance with respect to gravity gives information about the direction of the food. 2
2. The displacement of the waggle run to the right or left of the vertical is equal to the displacement of the food source to the right or left of a line running between the hive and the sun. 2
Bees can make adjustments in their dance to compensate for the shift in the sun throughout the day. 1
3. Diagram: 2



- C. 1. Other bees are told that the food source is in a direct line with the sun. 1
2. When the bee dances vertically downwards, the food is directly away from the direction of the sun. 1
- When the bee dances vertically upwards, the food is towards the sun. 1

3. Diagram:
Dance
Down



Dance
Up



Possible: 16

Maximum: 10

Teacher Notes

DRAFT

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Contribution of Scientists
CURRICULAR EMPHASIS: Nature of Science

INSTRUMENT CODE: B081KfSA.02
GUIDELINE OBJECTIVE CODE: 81Kf
INSTRUMENT TYPE: SA
KLOPPER: A.1, A.2
DIFFICULTY LEVEL: L
TIME ALLOCATION:

KEYWORDS: Lorenz behaviour imprinting

Guideline Objective

Students will be expected to briefly describe the ethological work and findings of individuals such as Lorenz, Tinbergen, von Frisch, and Goodall.

Item Focus

Same as above.

Item

Briefly describe the findings of Konrad Lorenz, and their significance.

Response/Marking Scheme

Konrad Lorenz found that certain species of birds	1
will form a strong attachment to the first slow-moving	1
object that they see, as long as this occurs during a certain critical period.	2
The significance of the finding is that there are critical periods in learned	
behaviour.	2
This has some relevance to human learning and behaviour.	1

Possible: 7

Maximum: 5

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Kin Selection
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: sociobiology

INSTRUMENT CODE: B081KgMC.01
GUIDELINE OBJECTIVE CODE: 81Kg
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3, A.5
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe, and state the adaptive value of, two or more innate behaviours of an invertebrate and a vertebrate, two or more examples of learned behaviour in a vertebrate, and two or more examples of social behaviour in a primate.

Item Focus

The student should be able to identify the meaning and survival advantage of kin selection.

Item

Kin selection refers to the observation that

- ☐ A. bees defend their hive against an attacking predator.
- ☐ B. related individuals co-operate in an attempt to ensure the survival of their common genetic background.
- ☐ C. related individuals tend to mate with each other.
- ☐ D. males and females from different family groups mate, and are monogamous for life.
- ☐ E. individuals in groups have a better chance of survival.

Response/Marking Scheme

Correct response: B

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Ethology
CURRICULAR EMPHASIS: Solid Foundations
KEYWORDS: pecking order

INSTRUMENT CODE: B081KgMC.02
GUIDELINE OBJECTIVE CODE: 81Kg
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students will be expected to describe, and state the adaptive value of, two or more innate behaviours of an invertebrate and a vertebrate, two or more examples of learned behaviour in a vertebrate, and two or more examples of social behaviour in a primate.

Item Focus

The student should be able to identify the adaptive value of learned behaviours.

Item

The relative standing of hens in a flock is based on:

- ☐ A. mating success.
- ☐ B. size.
- ☐ C. leadership qualities.
- ☐ D. the pecking order.
- ☐ E. the preference of the rooster.

Response/Marking Scheme

Correct response: D

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Innate Behaviour
CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KgER.01
GUIDELINE OBJECTIVE CODE: 81Kg
INSTRUMENT TYPE: ER
KLOPPER: A.1, A.2, A.3, a.5
DIFFICULTY LEVEL: M
TIME ALLOCATION:

KEYWORDS: adaptive value innate behaviour

Guideline Objective

Students will be expected to describe, and state the adaptive value of, two or more innate behaviours of an invertebrate and a vertebrate, two or more examples of learned behaviour in a vertebrate, and two or more examples of social behaviour in a primate.

Item Focus

The student should be able to describe and state the adaptive value of two innate behaviours for each of an invertebrate and a vertebrate.

Item

Name two innate behaviours of each of the following and state the adaptive value of each.

A. An invertebrate, such as a grasshopper.

B. A vertebrate, such as a frog.

Response/Marking Scheme

Behaviour

(any 2 @ 1 mark each)

Invertebrate (grasshopper)

jumping, gliding

making sound

lays eggs underground in waterproof sac

Vertebrate (frog)

jumps into water when disturbed

croaking

projects tongue forward

burrows in mud in fall

Adaptive Value (2 marks each)

moves rapidly, may avoid predators, may propel to a suitable grazing area

may attract mate for reproduction

eggs may be protected from freezing, species survives winter in egg state

may escape predator

may attract mate for reproduction

catches insects (prey) for food

survives winter in hibernation

Possible: 12

Maximum: 12

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Learned Behaviour
CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KgER.02
GUIDELINE OBJECTIVE CODE: 81Kg
INSTRUMENT TYPE: ER
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: M
TIME ALLOCATION:

KEYWORDS: adaptive value learned behaviour

Guideline Objective

Students will be expected to describe, and state the adaptive value of, two or more innate behaviours of an invertebrate and a vertebrate, two or more examples of learned behaviour in a vertebrate, and two or more examples of social behaviour in a primate.

Item Focus

The student should be able to describe and state the adaptive value of learned behaviour in a vertebrate.

Item

House sparrows have adapted very well to living near humans. Name two examples of learned behaviour in a vertebrate, such as a house sparrow, and state the adaptive value of each.

Response/Marking Scheme

Behaviour

(any 2 @ 1 mark each)

At the first sign of movement, the whole flock flies away

Use feeding stations around houses in winter.

Build nests in nooks in human structures: houses, sign-boards, even traffic signals.

Collect around bird-baths for drinking and bathing.

Adaptive Value (2 marks each)

May escape predation by cats.

Survival over winter depends on finding and consuming a reliable and adequate source of food daily.

Such locations are sheltered, (even heated) to aid in surviving the winter.

Ensure an adequate source of water for survival, cool body on hot day, reduce irritation from parasites.

Possible: 6

Maximum: 6

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Learned Behaviour
CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KgER.03
GUIDELINE OBJECTIVE CODE: 81Kg
INSTRUMENT TYPE: ER
KLOPPER: A.1, A.2, A.3
DIFFICULTY LEVEL: L
TIME ALLOCATION:

KEYWORDS: social behaviour pecking order

Guideline Objective

Students will be expected to describe, and state the adaptive value of, two or more innate behaviours of an invertebrate and a vertebrate, two or more examples of learned behaviour in a vertebrate, and two or more examples of social behaviour in a primate.

Item Focus

The student should be able to define a type of social behaviour, and explain the evolutionary advantages that this type of behaviour confers on a group.

Item

Define the term, "pecking order", and explain the evolutionary advantages of this pattern of social behaviour.

Response/Marking Scheme

"Pecking order" is a rank order of dominance among individuals in a particular population of animals.	2
The advantage for dominant individuals is that they will have priority of choice of food, shelter, and mates.	1
Having this settled reduces the damaging effects of competition between individuals of the group.	1
When essential resources are in short supply, the higher order members of the population will have a better chance of obtaining enough to survive.	1
In times of shortage, lower order members of the population, by virtue of age, deformity, or other disadvantages are more likely to die.	1
This strategy improves the chances of the population surviving at a time when deterioration of resources might threaten the extinction of the group.	1
In general, this strategy enhances reproductive success of these members of the population most likely to be best suited to their environment, by ensuring their survival and their breeding.	2

Possible: 9

Maximum: 7

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Social Behaviour
 CURRICULAR EMPHASIS: Solid Foundations

INSTRUMENT CODE: B081KgSA.01
 GUIDELINE OBJECTIVE CODE: 81Kg
 INSTRUMENT TYPE: SA
 KLOPPER: A.1, A.2, A.3, A.5
 DIFFICULTY LEVEL: M
 TIME ALLOCATION:

KEYWORDS: adaptive value

Guideline Objective

Students will be expected to describe, and state the adaptive value of, two or more innate behaviours of an invertebrate and a vertebrate, two or more examples of learned behaviour in a vertebrate, and two or more examples of social behaviour in a primate.

Item Focus

The student should be able to describe and state the adaptive value of two or more examples of social behaviour of a primate.

Item

Unlike many animals, chimpanzees, gorillas and humans practise a reproductive strategy of having offspring usually one at a time, and of caring for the infants for several years. What adaptive value would this reproductive behaviour have for the survival of these primate species?

Response/Marking Scheme

Primates are faced with changing living conditions that	1
require complex, learned behaviour.	1
Keeping the infants with the mother for a long period allows time for learning	
adaptive behaviour from the parents.	1
This enhances the probability of survival.	1

Possible: 4

Maximum: 4

Reference:

Wallace, Robert A., et al. *Biology, the Science of Life*.
 Glenview, Il: Scott, Foresman and Co, 1981, p. 1032.

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Animal Care Guidelines
CURRICULAR EMPHASIS: Nature of Science
KEYWORDS: animal care

INSTRUMENT CODE: B082a-MC.01
GUIDELINE OBJECTIVE CODE: 82a
INSTRUMENT TYPE: MC
KLOPPER: A.1, A.2, I.4, I.5
DIFFICULTY LEVEL: M
TIME ALLOCATION:

Guideline Objective

Students are to examine the guidelines or excerpts thereof of the Canadian Council on Animal Care and the Animals for Research Act and identify the appropriate procedures for care and treatment of animals in the laboratory.

Item Focus

The student should be able to identify the purpose of the guidelines on animal care.

Item

The Canadian Council on Animal Care has published a guide for the care of experimental animals. The purposes of this guideline are to ensure that students, teachers and researchers

I provide humane care for and handling of animals.

II minimize pain and discomfort for experimental animals.

III avoid unnecessary use of animals.

IV provide adequate housing for experimental animals.

V provide regulated environments with uniform conditions.

Select your answer from

☐

A. I only.

☐

B. I and II only.

☐

C. I, II and III only.

☐

D. I, II, III, IV and V.

☐

E. III, IV and V only.

Response/Marking Scheme

Correct response: D

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
LEVEL: OAC
UNIT NUMBER: OU 1
UNIT NAME: ANIMAL BEHAVIOUR
TOPIC: Animal Care Guidelines
CURRICULAR EMPHASIS: Nature of Science
KEYWORDS: animal care Animals for Research Act

INSTRUMENT CODE: B082a-MC.02
GUIDELINE OBJECTIVE CODE: 82a
INSTRUMENT TYPE: MC
KLOPPER: A.1 A.2, I.4, I.5
DIFFICULTY LEVEL: L
TIME ALLOCATION:

Guideline Objective

Students are to examine the guidelines or excerpts thereof of the Canadian Council on Animal Care and the Animals for Research Act and identify the appropriate procedures for care and treatment of animals in the laboratory.

Item Focus

The student should be able to identify individuals who are required to comply with the terms of *The Animals for Research Act*(Ontario).

Item

Which of the following people are governed by *The Animals for Research Act* (Ontario)?

- ☐ A. An elementary school teacher who maintains a pet hamster in the classroom.
- ☐ B. A secondary school teacher who maintains fish in an aquarium in the classroom.
- ☐ C. A research scientist who uses animals to test the effectiveness of chemicals.
- ☐ D. A testing laboratory that uses animals to identify particular disease organisms.
- ☐ E. All of the above.

Response/Marking Scheme

Correct response: E

Teacher Notes

DISCIPLINE/SUBJECT: Science/Biology
 LEVEL: OAC
 UNIT NUMBER: OU 1
 UNIT NAME: ANIMAL BEHAVIOUR
 TOPIC: Animal Care Guidelines
 CURRICULAR EMPHASIS: Nature of Science
 KEYWORDS: animal care committee

INSTRUMENT CODE: B082a-ER.01
 GUIDELINE OBJECTIVE CODE: 82a
 INSTRUMENT TYPE: ER
 KLOPPER: A.1, A.2, I.4, I.5
 DIFFICULTY LEVEL: M
 TIME ALLOCATION:

Guideline Objective

Students are to examine the guidelines or excerpts thereof of the Canadian Council on Animal Care and the Animals for Research Act and identify the appropriate procedures for care and treatment of animals in the laboratory.

Item Focus

The student should be able to describe the responsibilities of an Animal Care Committee.

Item

By law in Ontario, every Board of Education is required to have an Animal Care Committee. What are the responsibilities of this committee?

Response/Marking Scheme

An Animal Care Committee is responsible for co-ordinating and reviewing the activities and procedures relating to the care of animals.

the standards of care and facilities for animals

the training and qualifications of personnel engaged in the care of animals, and

the procedures for the prevention of unnecessary pain (including the use of anaesthetics and analgesics.)

Possible: 4

Maximum: 4

Teacher Notes

Min Gu OAC biology : optional
574. unit I : animal
0760713 behaviour
059bi
Unit

1

